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(54) Locking device for the brake pedal of a vehicle to the pressure rod of a power brake

(57) The object of this invention is a locking device for the brake pedal (10) of a vehicle to the pressure rod (15) of the power brake, of the type in which the pressure rod forms a spheric end (14) and the pedal bears a substantially spheric end (13) and quick-mount elastic means are provided (20a,20b) ensuring the release-type fastening of the spheric end (14) to the pedal (10) in a spheric joint type configuration. The elastic means (20a,20b) are part of an interchangeable insert (17) equipped with means (18a,18b) for quick interchangeable locking to the pedal, insert (17) is an open-ring shaped insert, with a longitudinal opening (21) allowing pressure rod release in a direction perpendicular to the pressure rod axis.

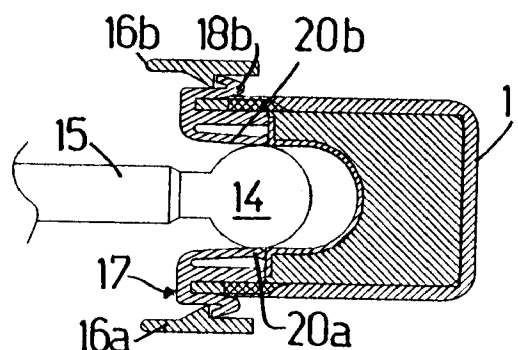


FIG. 4

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Description

[0001] The invention relates to a locking device for the locking of the brake pedal of a vehicle to the test prod of the power brake.

[0002] Commonly known embodiments of locking systems are characterized by the fact that the test prod of the power brake creates a spheric end and the pedal bears a corresponding spheric seat. Some of these devices, such as the device described in European patent EPB-0 229 350, include sickly mounted elastic means that ensure the release-type fastening of the spheric end to the pedal in a spheric joint type configuration. These quick-mount means are usually composed of two resiliently divaricatable keys that are fixed with the pedal or with a support fixed to the latter, therefore pushing the test prod into the seat, overcoming the elastic constraint ensured by such keys. They keys close on the test prod in a release-type closure, pressing against the rounded end of the test prod, preventing it from being released from the pedal, and allow the articulated movement of the pedal, within a certain angle.

[0003] This type of device presents a few practical problems. Such problems appear when the pedal is removed from the power brake to carry out maintenance operations. With connection systems of the type known it is difficult to release the elastic keys, as they are located in such a way as to render access to them difficult. It is also necessary to use an appropriate instrument that needs to be inserted in the test prod and pushed to divaricate the elastic keys in order to free the test prod from the pedal. Moreover, this type of intervention presents the risk of damaging the keys, that are usually made of plastic materials, not suited to withstand numerous interventions.

[0004] It is an object of the present invention to carry out a simple, low cost device that will simplify the release of the prod release on the power brake of the pedal, reducing time required to carry out such interventions and making it possible to avoid any inconvenience mentioned previously.

[0005] This and other objects and advantages, that will be further understood in the following description, can be attained according to the present invention through a locking device for the brake pedal of a vehicle to the test prod of the power brake, of the type in which the test prod forms a spheric end and the pedal has a substantially spheric seat, and quick mount elastic means are provided for the release-type mounting of the spheric end to the pedal in a spheric joint type configuration, characterized by the fact that said elastic means are part of an interchangeable insert equipped with quickly fastened means that can be fastened to the pedal in an interchangeable way, and where said insert is an open ring shaped insert with a longitudinal opening for test prod release in a direction perpendicular to the axis of the test prod.

[0006] There will now be described the structural and

functional characteristics of a preferred but not unique embodiment of the present invention, reference being made to the accompanying drawings, in which :

5 Figure 1 is an enlarged perspective view of the brake pedal and of the components of the locking device object of the present invention ;
Figure 2 is a sectional view of the pedal, locked onto the test prod of the power brake by way of the device object of the present invention ;
10 Figure 3 to 5 are sectional views of the locking phase of the power brake test prod to the device object of the present invention ;
Figure 6 is a section view that illustrates the opposite change phase, and
15 Figure 7 is an enlarged perspective view of said change phase.

[0007] Reference being made to Figures 1 and 2, with the numeral 10 indicating the brake pedal, in which a support base 11 equipped with a cylinder-shaped seat 12 suited for the installation of a substantially hemispheric sleeve 13 in which, with the test prod mounted, the spheric head 14 is engaged in an articulated way, constituting an enlarged end of test prod 15 of the power brake.

[0008] Two resiliently divaricatable fins, 16a and 16b, are installed on support base 11, on the sides of the cylinder-shaped seat 12. These fins lock onto a substantially open ring-shaped insert 17 in a release-type lock, in an interchangeable way. Insert 17 includes, in positions corresponding to those of the interchangeable fins 16a and 16b of support base 11, a set of couplings 18a and 18b. These couplings engage in release-type way in fins 16a and 16b, respectively.

[0009] Insert 17, preferably prepared in plastic material, has an internal cylinder-shaped wall 19 that is inserted in the cylinder-type seat 12 of support base 11. On the internal section of cylinder-shaped wall 19 the insert forms two converging and resiliently interchangeable keys 20a and 20b, that extend from the back end 22 of the insert to inside the cylinder-shaped wall 19, where they are closed, tightening towards the pedal, in a direction defined previously. In the embodiment illustrated in the accompanying figures, keys 20a and 20b are curved in order that they are located on an ideal frustoconical-type surface, that is larger on the back end of insertion of the test prod head and is reduced progressively towards the front end. When the test prod is mounted, free ends (or front ends) of keys 20a and 20b point against the front end of head 14 of the test prod, preventing pedal release.

[0010] Also according to the present invention, the annular insert 17 is open, and creates an opening or longitudinal opening 21 of whose width corresponds to the diameter of the power brake test prod 15, opening 21 should preferably be carried out according to a plane perpendicular to the flexure plane of keys 20a and 20b.

[0011] Reference being made to Figure 3, to connect the test prod of the power brake to the support base of the brake pedal, the locking device complete with hemispheric sleeve 13 and insert 17 is mounted in support base 11, couplings 18a and 18b are engaged in respective fins 16a and 16b, and the hemispheric sleeve 13 is fixed between insert 17 and support base 11. The axial length of the cylinder-shaped wall 19 of insert 17 is chosen in order that, when mounted, it blocks sleeve 13 against support base 11, integral with the pedal.

[0012] Once the test prod head is positioned against keys 20a and 20b, the pedal is pushed forward, divaricating the keys in contrast with the elastic action they exert (Figure 4), until head 14 is inserted in a release-type way into hemispheric sleeve 13 (Figure 5). Figure 2 illustrates the brake pedal connected to the test prod of the power break, locked on. In this type of configuration, a rotating movement relative to the pedal with respect to the test prod is possible, within a certain rotation angle.

[0013] Reference being made to Figures 6 and 7, when it is necessary to release the pedal from the test prod of the power brake, it is necessary to resiliently divaricate fins 16a and 16b, releasing couplings 18a and 18b, and releasing the group constituted by pedal 15 and insert 17 from the pedal, releasing the test prod in the longitudinal direction indicated by arrow A in Figure 7. The insert can be removed from the test prod, sliding the latter from the longitudinal opening 21 of the insert in the direction perpendicular to the test prod axis, in the direction indicated by arrow B in Figure 7. Opening 21 will bear dimensions allowing easy sliding, or at least requiring as little effort as possible, when the latter is slightly smaller in width than test prod diameter.

[0014] As will be noticed, the device object of the present invention makes it possible to release the power brake test prod from the pedal in an easy way, without the need for special tools. Moreover, the pedal is released with having to intervene on the elastic keys, that may be damaged as a result of numerous interventions.

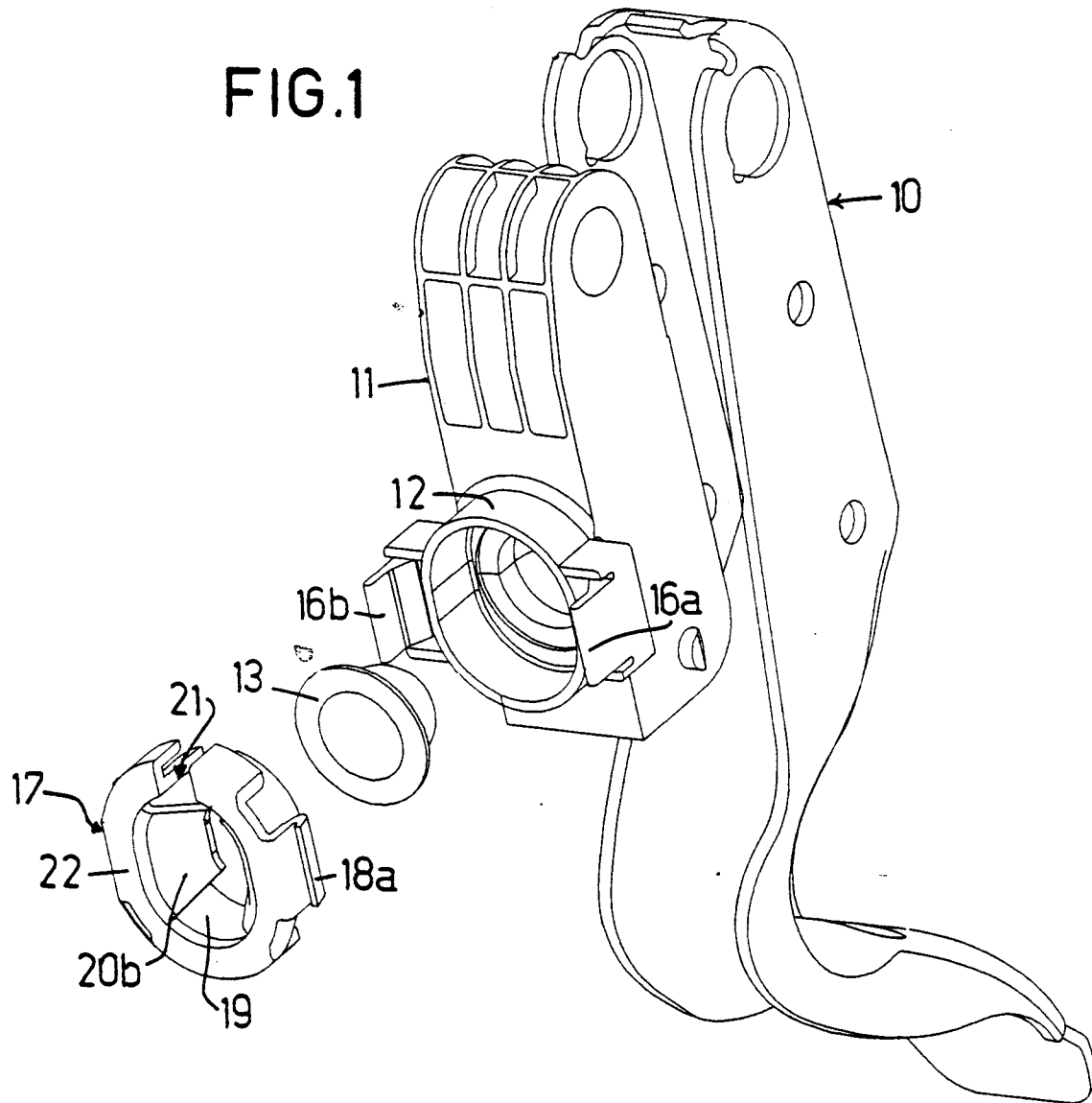
[0015] The invention is not limited to the embodiment described and illustrated here, and should be considered an example of an embodiment of the device. The invention can, on the other hand, undergo changes with respect to the shape and location of certain parts, construction and functional details. The invention is intended to include all the variants specific to the field, as defined in the following claims.

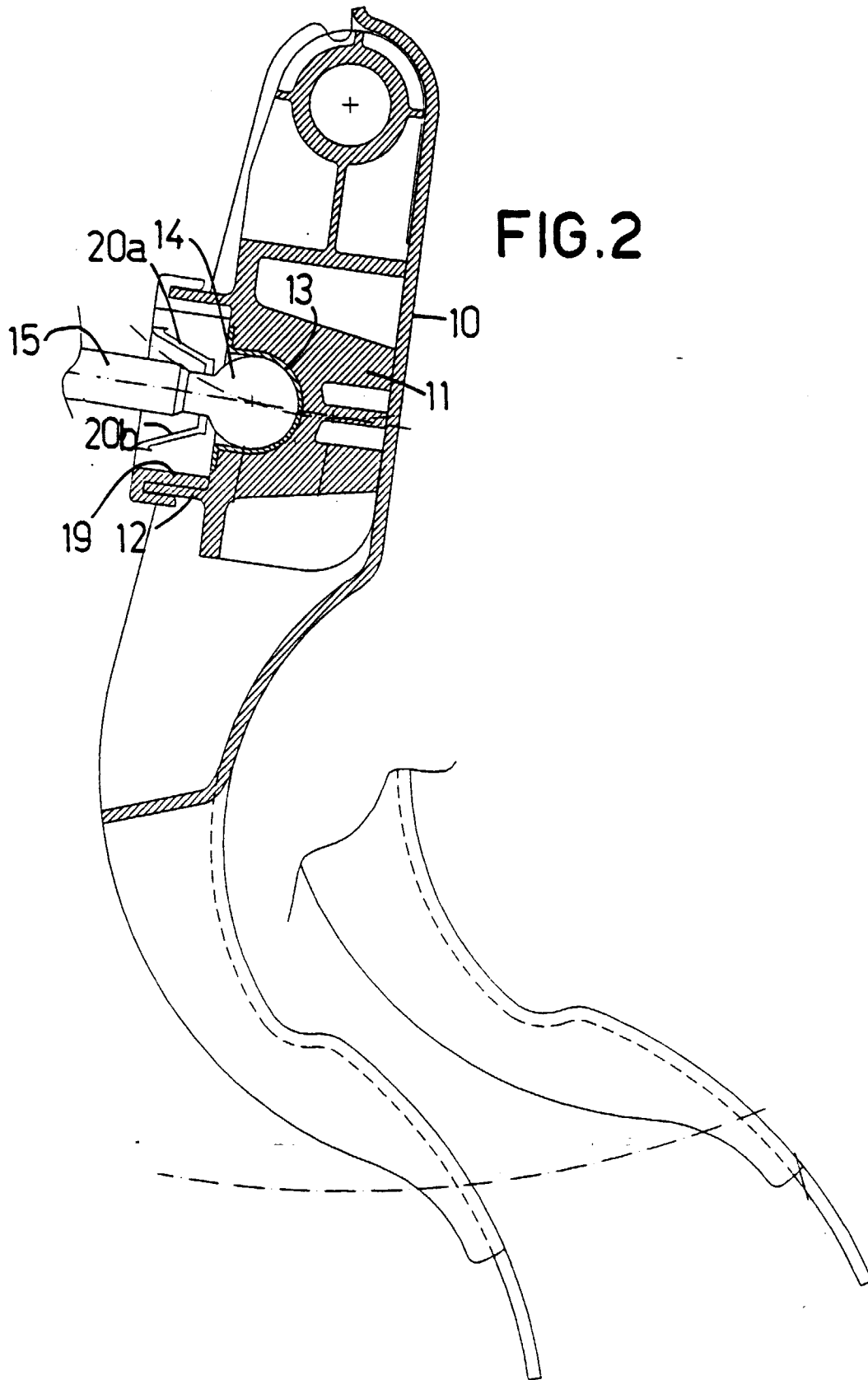
Claims

1. Locking device for the pedal (10) of the brake of a vehicle to the test prod (15) of the power brake, of the type in which the test prod forms a spheric end (14) and the pedal bears a substantially spheric seat (13), and quick-mount elastic means (20a, 20b) are included for the release-type fastening of the spheric end (14) to the pedal (10) in a spheric

joint-type configuration, characterized by the fact that said elastic means (20a, 20b) are part of an interchangeable insert (17), equipped with means (18a, 18b) for quick interchangeable locking onto the pedal, and where said insert (17) is a substantially open-ring shaped insert equipped with a longitudinal opening (21) suited to allow test prod release in a direction perpendicular to the axis of the test prod.

2. Device according to claim 1, characterized by the fact that the width of said longitudinal opening (21) substantially corresponds to the diameter of the power brake test prod (15).
3. Device according to claim 1, characterized by the fact that said means (18a, 18b) for quick locking of the insert (17) to the pedal are composed of a set of couplings that engage in an interchangeable way onto two corresponding resiliently divaricable fins (16a, 16b), integral with the pedal.
4. Device according to claim 1, characterized by the fact that said elastic means (20a, 20b) are composed of two keys converging in the direction of the pedal, and resiliently divaricable.
5. Device according to claim 4, characterized by the fact that said keys (20a, 20b) are curved inwards according to an ideal frustoconical-shaped surface, that is wider on the end section (22) or entrance section of the test prod and tightens on the pedal side.
6. Device according to claim 4, characterized by the fact that said keys (20a, 20b) extend from the back section (22) of the insert (17) to the inside section of the cylinder-shaped wall (19) of the insert (17).
7. Device according to claim 6, characterized by the fact that the axial length of the cylinder-shaped wall (19) of the insert (17) is such that, when mounted, it blocks a separate sleeve (13) against the pedal, said sleeve creating said spheric seat.
8. Device according to claims 1 and 4, characterized by the fact that said opening (21) is carried out according to a longitudinal plane perpendicular to the flexure plane of the keys (20a, 20b).





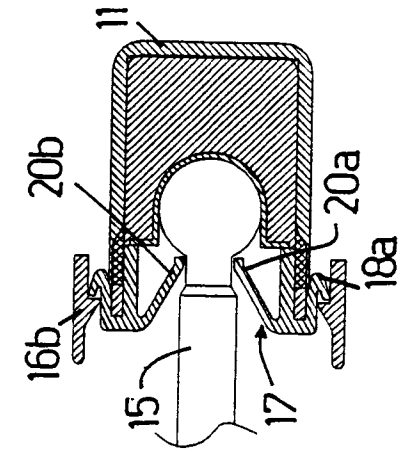


FIG. 3

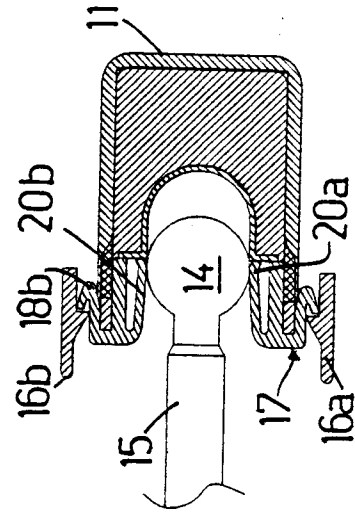


FIG. 4

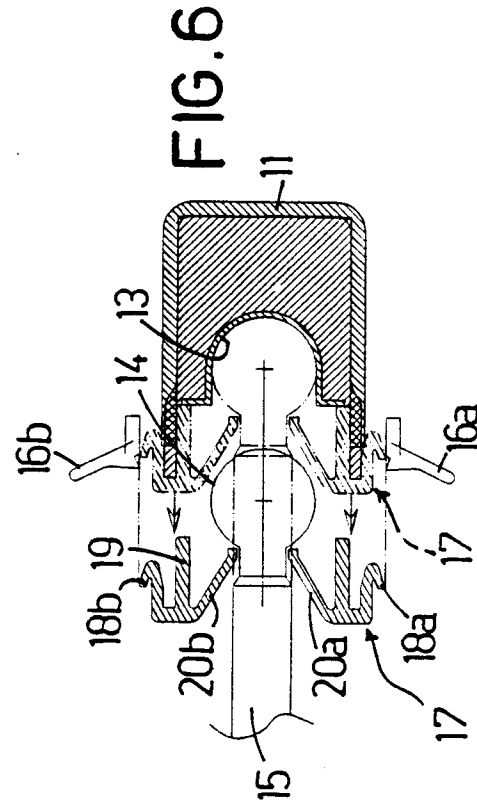
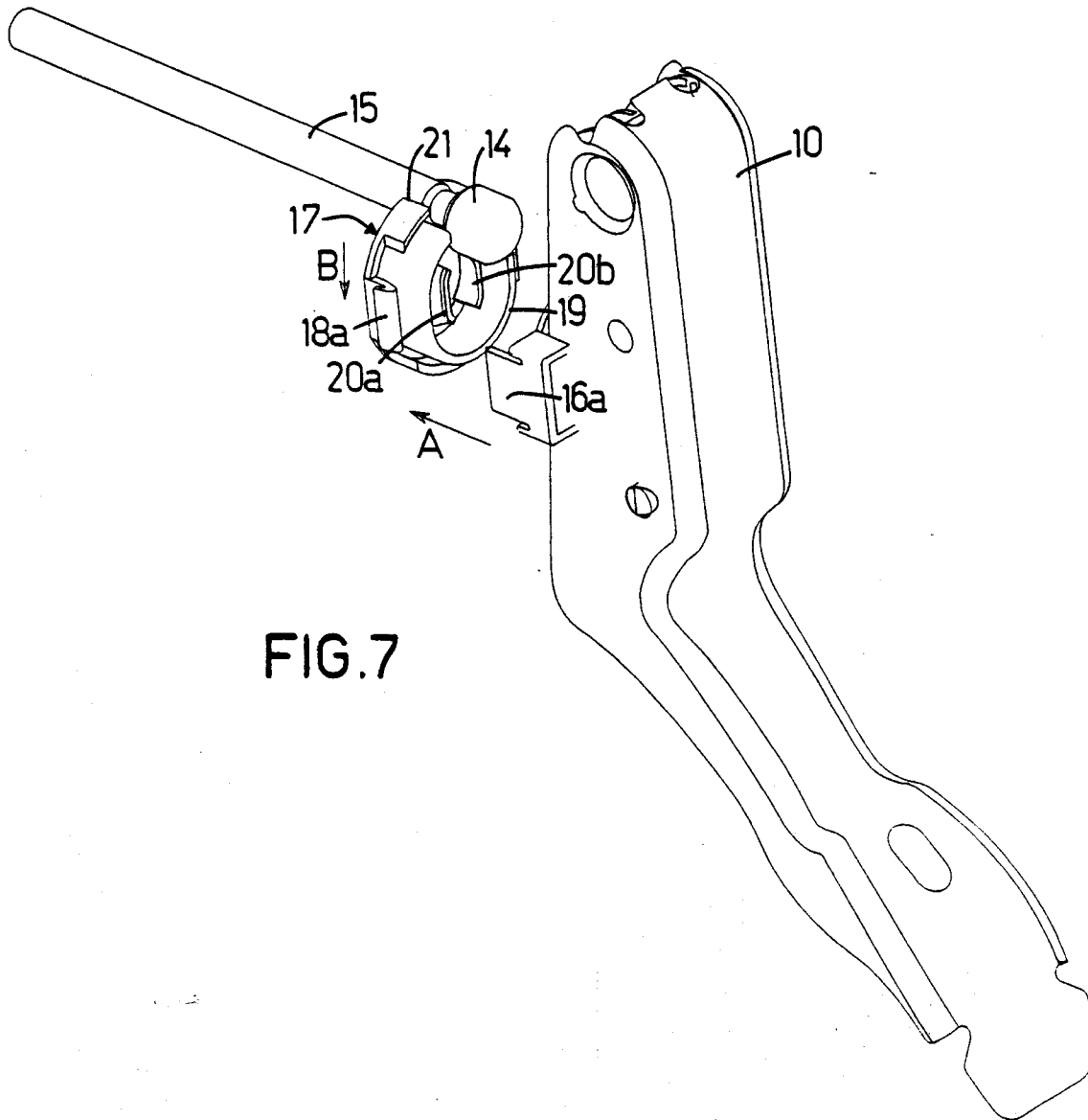


FIG. 5





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EUROPEAN SEARCH REPORT

Application Number
EP 98 11 3558

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 5 653 548 A (AMDAHL) 5 August 1997 * column 5, line 36 - column 6, line 9; figures 1-3 *	1	F16C11/06
A	EP 0 413 623 A (AIRAX) 20 February 1991 * abstract; figures 1-11 *	1	
A	FR 2 713 729 A (VALEO VISION) 16 June 1995 * abstract; figures 1-7 *	1	
A	EP 0 773 377 A (TRW FAHRWERKSYST) 14 May 1997 * abstract; figures 1,2 *	7	
D,A	EP 0 229 350 B (VOLKSWAGENWERK) 22 July 1987		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F16C B60T
Place of search		Date of completion of the search	Examiner
BERLIN		14 October 1998	Ludwig, H.J.
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